PTO 09-5541

JP
19840319
A
59048040

METHOD FOR IMPROVING THE QUALITY OF FLOUR
[Komugiko no hinshitsu kairyoho]

Masanori Yamamoto et al.

UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. MAY 2009
TRANSLATED BY: THE MCELROY TRANSLATION COMPANY

PUBLICATION COUNTRY	(19):	JP
DOCUMENT NUMBER	(11):	59048040
DOCUMENT KIND	(12):	A
PUBLICATION DATE	(43):	19840319
APPLICATION NUMBER	(21):	57160559
APPLICATION DATE	(22):	19820913
INTERNATIONAL CLASSIFICATION[3]	(51):	A 21 D 6/00
INVENTORS	(72):	Masanori Yamamoto et al.
APPLICANT	(71):	House Food Industry K.K.
TITLE	(54):	METHOD FOR IMPROVING THE QUALITY OF FLOUR
FOREIGN TITLE	[54A]:	Komugiko no hinshitsu kairyoho

Claim

A method for improving the quality of flour characterized by the flour being brought into contact with ozone.

Detailed explanation of the invention

The present invention concerns a method for improving the quality of flour. In more detail, it concerns a method for obtaining flour in a very short processing time with improved quality without problems in food product sanitation.

Improvement in the quality of flour in this invention refers to the improvements of flour quality that are generally known including improvement in elasticity when the flour is prepared into dough and improvements in the secondary processing adaptability, such as outer appearance and chewing texture when the flour is manufactured into bread, etc.

For conventionally improving the quality of flour, the flour was heat-processed for a long period of time, or quality improving agents, such as potassium bromate, ammonium persulfate, or benzoyl peroxide, for example, were added, or chlorine dioxide gas or nitrogen dioxide gas, for example, were directly brought into contact with the flour.

However, the heat processing of flour takes a long time. Therefore, the processing efficiency is very poor, and the improvement of the flour was not sufficiently satisfactory.

Not only do the methods that add quality improving agents or processing with gases, such as chlorine dioxide gas, for example, not have the disadvantage of requiring a long processing time such as in heat-processing but they also have a very remarkable effect for improving flour quality. However, when the said quality improving agents and gases like nitrogen dioxide are used, they remain in the flour.

Some of these quality improving agents and gases, such as nitrogen dioxide gas, for example, include potassium bromate, which is questionable as a carcinogen and ammonium persulfate, which causes allergies, for example, and they were not necessarily desirable in food products.

Under such circumstances, the development of a method that does not use a quality improving agent, etc. that may have an issue in food product sanitation and that can also improve the quality of flour in a short period of time has been strongly requested at present.

The inventors of the present invention have paid attention to said point, and have studied flour quality improving methods that can improve the quality of flour without using the aforementioned quality improving agents and gases that are not desirable in terms food product sanitation.

As a result, knowledge has been obtained by which the quality of flour can be improved in a relatively short period of time by allowing the flour to come in contact with ozone.

The essence of this invention, which has been completed based on said knowledge, is a quality improving method for flour characterized by the flour being brought into contact with ozone.

The contents of this invention will be described in detail below.

Ozone is an allotrope of oxygen. It is generated through discharge, photochemical, and electrolytic reactions, for example, and the production method that is used most often at present is silent discharge. Silent discharge is a discharging phenomenon that occurs when an ac voltage of 5-25 KV is applied between 2 electrode plates, and ozone is formed when a silent discharge is performed in air or oxygen. This ozone generating method is utilized in ozone generators generally known at present.

Accordingly, the aforementioned ozone generator may be used as a method for generating ozone in this invention.

To have the flour come into contact with ozone in this invention, the ozone is first generated by the ozone generator. Next, the generated ozone is formed into an ozone current or an ozone containing gas

current, and it is brought into contact with the flour. In this case, a method that contacts the flour with ozone with good efficiency is desirable. For that, it is convenient to use a method that allows the flour to come in contact with ozone while being stirred, or a method that adds and mixes the flour together in the ozone current or the ozone containing gas current. Although it differs relative to the ozone concentration and the processing amount of the flour, etc., the contacting time of the flour with ozone of about 5 min is sufficient.

The flour that is obtained in this way has the same level of quality as flour, in which the quality has been improved by general heat processing or potassium bromate, for example, or even more improved quality.

Comparative test examples

Method of this invention

300 g of flour (strong flour) is stirred in a stirrer/mixer. Next, ozone that is generated by an ozone generator, which is formed in an ozone containing gas current, is sprayed onto the aforementioned flour. The ozone concentration during this is 1g/time (ozone generation rate). The ozone processing of flour by the aforementioned method is performed for 5 min.

The physical properties of the flour that is obtained are measured by farinogram and extensogram.

Addition of potassium bromate

After adding 6 mg% (for the flour) of potassium bromate to 300 g of flour (strong flour), the physical properties were measured by farinogram and extensogram.

No processing

The physical properties of 300 g of flour (strong flour) were measured by farinogram and extensogram.

Table 1 shows the measurement results by farinogram. Figures 1 and 2 and Tables 2 and 3 show the measurement results by extensogram.

In Table 1, Abs is the water absorption of the flour when the water content of the flour is 13.5%. PT refers to the time from the start of mixing to contacting the 500 B.U. line (arrival time: min). Stab refers to the time from the arrival time before its upper end leaves the 500 B.U line (stability: min). V.V. refers to the valorimeter value that takes the central point of the farinogram 12 min after the arrival time, and this is applied to a special scale and measured.

Next, the vertical axis in Figures 1 and 2 indicates the tensile strength (B.U.) of the flour dough, and the horizontal axis indicates the elongation level (cm) of the flour dough. Figure 1 shows the extension patterns when the flour dough has rested for 45 min. Figure 2 shows the extension patterns when the flour dough has rested for 135 min. Table 2 also shows the extension patterns in Figure 1 numerically. Table 3 shows the extension patterns in Figure 2 numerically. In the tables, R is the tensile strength, and E is the elongation level.

TABLE 1

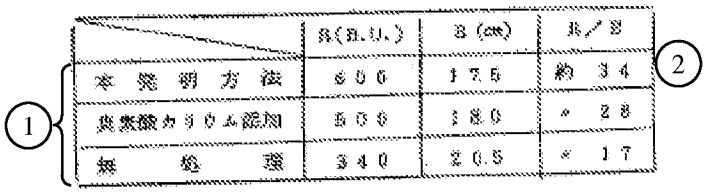
	Abs	PT	STab	V.V.
① 本発明方法	65.6	7.5	9.5	80
臭素酸カリウム添加	65.6	5.8	9.6	71
無処理	64.4	4.0	8.1	66

Key: 1 The method of this invention

Addition of potassium bromate

No processing

TABLE 2



	A(B.U.)	B (cm)	B/A
本発明方法	600	17.5	約 34
臭素酸カリウム添加	500	18.0	〃 28
無処理	340	20.5	〃 17

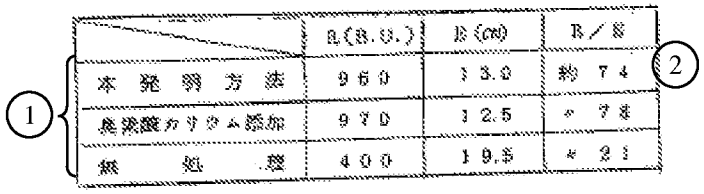
Key: 1 The method in this invention

Addition of potassium bromate

No processing

2 About 34

TABLE 3



	A(B.U.)	B (cm)	B/A
本発明方法	960	13.0	約 74
臭素酸カリウム添加	970	12.5	〃 78
無処理	400	19.5	〃 21

Key: 1 The method in this invention

Addition of potassium bromate

No processing

2 About 74

When the flour that is obtained by the method of this invention is compared to unprocessed flour in Table 1, Abs is higher with the first one than in the latter, and PT and Stab are also longer than in the first one. Furthermore, when V.V. is compared, this is also longer in the first one than in the latter.

From these, the strength of the dough from flour that is obtained by the method in this invention is stronger than in unprocessed flour. That level indicates the numbers that are at same levels of Abs, PT, Stab, and V.V. as in the addition of potassium bromate or more. Accordingly, it is about at the same level as in the addition of potassium bromate or more.

Next, observing the extension patterns in Figures 1 and 2, the pattern of the flour (A) obtained by the method in this invention has a stronger tensile strength when compared to (B) that is unprocessed, and the elongation level is also short, and it resembles the pattern (C) with the addition of potassium bromate. This is also clearly shown in the numbers of the extension pattern indicated in Tables 2 and 3. When R/E values in Tables 2 and 3 are observed, the R/E value was higher in both the method in this invention and with the addition of the potassium bromate than in the unprocessed, which indicates that the 'firmness' or 'texture' strength of the dough is better in the flour that is obtained by the method of this invention than in the flour that is not processed, and that level is about the same or more than with the addition of potassium bromate.

In this manner, the flour that is obtained by the method of this invention has clearly improved quality of elasticity of flour dough, and the quality in the secondary processing adaptability to bread, etc. that results from the elasticity of the flour dough is also improved.

The flour quality improving method of this invention with the aforementioned characteristic uses ozone that is not at all problematic in the sanitation of food products. Therefore, there is no issue of the quality improving agent and nitrogen dioxide gas, for example, remaining in the flour. Moreover, there is the advantage of the time required for the quality improving process being much shorter than in heat processing, for example.

Application example

300 g of flour is stirred in a stirrer/mixer. Next, the ozone that is generated by an ozone generator formed as an ozone containing gas current is sprayed onto the aforementioned flour. The ozone concentration during this is 2 g/time (ozone generation rate). The flour is processed with ozone by the aforementioned method for 1 min, and flour with an improved quality is obtained.

Brief description of the figures

Figure 1 shows the extension patterns when the flour dough has rested for 45 min. Figure 2 shows the extension patterns when the flour dough has rested for 135 min.

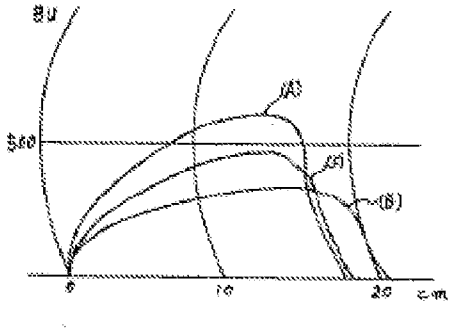


Figure 1

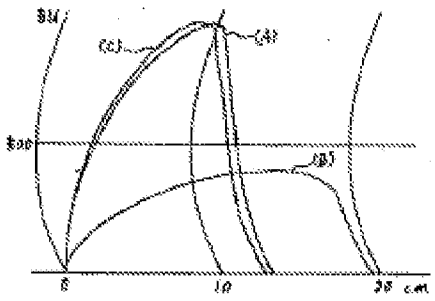


Figure 2